

CLAIMS

1. A non-aqueous, radiation-curable ink comprising pigment, dispersant and a liquid carrier, wherein the pigment has an acid value greater than 8 mg of NaOH per gram of pigment.

2. An ink according to claim 1 having a viscosity of 1 to 30 mPa.s at 60°C.

3. An ink according to any one of the preceding claims wherein the dispersant contains amine and/or imine groups.

4. An ink according to any one of the preceding claims wherein the dispersant is a polyester amine or imine.

5. An ink according to any one of the preceding claims wherein the pigment is carbon black pigment having a BET surface area of 50 to 400 m²/g.

6. An ink according to any one of the preceding claims wherein the pigment is carbon black pigment having DBP absorption of 50 to 200 ml/100g.

7. An ink according to any one of the preceding claims wherein the pigment has a pH below 7.

8. An ink according to any one of the preceding claims wherein the pigment has covalently attached acidic groups.

9. An ink according to any one of the preceding claims which is substantially solvent-free.

10. An ink according to any one of the preceding claims wherein the carrier comprises a mixture comprising one or more mono (meth)acrylate compounds, one or more di (meth)acrylate compounds and one or more compounds having three or more (meth)acrylate groups.

11. An ink according to any one of the preceding claims wherein the carrier comprises a mixture of:

(a) 0 to 70 parts of mono (meth)acrylate compound(s);

(b) 5 to 99.9 parts of di (meth)acrylate compound(s);

(c) 0 to 70 parts of compound(s) having three or more (meth)acrylate groups;

and

(d) 0.1 to 15 parts of photoinitiator(s);

wherein all parts are by weight and the number of parts (a) + (b) + (c) + (d) add up to 100.

12. An ink according to any one of the preceding claims which is free from particles that would block an ink jet nozzle.

13. A non-aqueous, substantially solvent-free radiation curable ink according to any one of the preceding claims having a viscosity of 1 to 30m Pa.s at 60°C and comprising:

- (i) 1 to 10 % of one or more pigments having an acid value in the range 12 to 40 mg of NaOH per gram of pigment, a BET surface Area of 100 to 250m²/g and a DBP absorption of 80 to 150ml/100g;
- (ii) 0.5 to 6% of one or more dispersants having amine and/or imine groups; and
- (iii) the balance to 100% being a liquid carrier;

wherein all % are by weight and the liquid carrier comprises a mixture of:

(a) 0 to 70 parts of one or more mono (meth)acrylate compound(s) selected from the group consisting of cyclic trimethylolpropane formal (meth)acrylate, ethoxylated tetra hydrofurfuryl (meth)acrylate, phenoxy ethyl (meth)acrylate, trimethylol propane formal (meth)acrylate, lauryl (meth)acrylate, stearyl (meth)acrylate, monomethoxy neopentyl glycol propoxylate mono (meth)acrylate, monomethoxy tripropylene glycol mono (meth)acrylate, 2-(2-ethoxyethoxy) ethyl (meth)acrylate, iso-decyl (meth)acrylate, iso-octyl (meth)acrylate, iso-nonyl (meth)acrylate, tridecyl (meth)acrylate, iso-bornyl (meth)acrylate, ethoxyl nonyl phenol (meth)acrylate, ethoxylated phenol (meth)acrylate, 2-hydroxyl ethyl (meth)acrylate, 4-hydroxyl butyl (meth)acrylate, 2-hydroxy propyl (meth)acrylate, iso-butyl (meth)acrylate, tert-butyl (meth)acrylate, cetyl (meth)acrylate, cyclohexyl (meth)acrylate, ethyl hexyl (meth)acrylate, 2-dimethyl amino ethyl (meth)acrylate, trifluoro ethyl (meth)acrylate, 3-methoxy butyl (meth)acrylate, dicyclopentenyl (meth)acrylate, polyethylene glycol mono (meth)acrylate and poly propylene glycol mono (meth)acrylate and mixtures thereof;

(b) 5 to 99 parts of one or more di (meth)acrylate compound(s) selected from the group consisting of di(meth)acrylates of 1,4-butane diol, 1,6-hexane diol, neopentyl glycol, mono, di, tri and poly ethylene glycols, mono, di, tri and poly propylene glycols, mono methoxy ethoxylated trimethylolpropane, propoxylated neopentyl glycol, ethoxylated neopentyl glycol, 1,2-butylene glycol and ethoxylated hexane diol and mixtures thereof; and

(c) 0 to 70 parts of one or more compound(s) having three or more (meth)acrylate groups selected from the group consisting of trimethylol propane tri(meth)acrylate, ethoxylated trimethylol propane tri(meth)acrylate,

propoxylated trimethylol propane tri(meth)acrylate, glycerol tri(meth)acrylate, propoxylated glycerol tri(meth)acrylate, pentaerythritol tri(meth)acrylate, pentaerythritol tetra(meth)acrylate, tris (2-hydroxyethyl) isocyanurate triacrylate, ditrimethylol propane tetra (meth)acrylate, ethoxylated pentaerythritol tetra(meth)acrylate, ethoxylated di-pentaerythritol tetra (meth)acrylate, tetra methylol methane tetra (meth)acrylate, multifunctional (meth)acrylate-urethanes, (meth)acrylate-polyesters and (meth)acrylate acrylics and mixtures thereof; and

(d) 0.1 to 15 parts of one or more photoinitiator(s);

wherein all parts are by weight and the number of parts (a) + (b) + (c) + (d) add up to 100.

14. An ink according to claim 13 wherein component (a) is present in an amount of 10 to 60 parts, component (b) is present in an amount of 10 to 85 parts and component (c) is present in an amount of 5 to 50 parts.

15. A process for printing an image onto a substrate comprising applying thereto an ink according to any one of the preceding claims by means of an ink jet printer and curing the ink.

16. A printed metal, plastic, ceramic, glass, wood or paper substrate obtained by the process of claim 15.

17. An ink jet printer cartridge comprising a chamber and an ink wherein the ink is present in the chamber and is as defined in any one of claims 1 to 14.